

Abstract of the Disclosure

A semiconductor device for detecting organic molecules is provided and affords higher sensitivity and better durability with respect to synthetic treatment of organic molecule probes. In one implementation, an organic molecule detecting semiconductor device 100 has pixels (including photoelectric converters) 110 disposed on a front (first main side) 101A of a silicon substrate 101, and recesses 112 in which DNA probes 161 are fixed are formed on a rear (second main side) 101B. Hence the bottoms of the recesses 112 serve as organic molecule probe disposition regions. The organic molecule detecting semiconductor device 100 constitutes a back-incident frame transfer (FT) type of CCD solid-state imaging device. In the analysis of DNA or other organic molecules, there is no need for the separate provision of an optical system for reading the light produced from a target (e.g., DNA of a specified structure). The overall apparatus is more compact and the manufacturing costs are reduced. Also, the pixels 110 formed by semiconductor manufacturing technology and the DNA probes 161 formed by organic chemical treatment are formed on mutually different sides.